

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
29 July 2004 (29.07.2004)

PCT

(10) International Publication Number
WO 2004/063233 A2

(51) International Patent Classification⁷: C08F 10/00,
4/642, 4/70, 4/80, C07F 7/00, 15/00

PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(21) International Application Number:
PCT/GB2004/000109

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-
pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,
GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, SN, TD, TG).

(22) International Filing Date: 9 January 2004 (09.01.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0300821.6 14 January 2003 (14.01.2003) GB

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted
a patent (Rule 4.17(ii)) for the following designations AE,
AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ,
CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE,
EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS,
JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA,
MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM,
PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ,
TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM,
ZW. ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD,
SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY,
KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG,
CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT,
LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ,
CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD,
TG)
- of inventorship (Rule 4.17(iv)) for US only

(71) Applicant (for all designated States except US): BP
CHEMICALS LIMITED [GB/GB]; Britannic House, 1
Finsbury Circus, London EC2M 7BA (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): GIBSON, Vernon,
Charles [GB/GB]; Flat 2, 46 Prince's Gate, Exhibition
Road, London SW7 2QA (GB). REARDON, Damien,
Francis [CA/CA]; 1-31 Russell Avenue, Ottawa, Ontario
K1N 7W9 (CA). TOMOV, Atanas, Kostadinov [BG/GB];
3 Westfield Road, Croydon, Surrey CR0 3RH (GB).

(74) Agent: HYMERS, Ronald, Robson; BP International
Limited, Patents & Agreements, Chertsey Road, Sun-
bury-on-Thames, Middlesex TW16 7LN (GB).

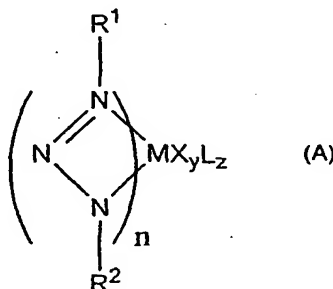
Published:

- without international search report and to be republished
upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,

(54) Title: POLYMERISATION CATALYSTS



(57) Abstract: A polymerisation catalyst comprising (1) a nitrogen-containing transition metal compound of Formula A, and (2) an organoaluminium or hydrocarbylboron activa-
tor, wherein either (a) R¹ and R² are monovalent groups or (b) R¹ and R² integrally form
a divalent group R³ bridging the terminal nitrogen atoms of the triazine unit via carbon
atoms; R¹ and R² and the divalent group R³ are (i) aliphatic hydrocarbon, (ii) alicyclic
hydrocarbon, (iii) aromatic hydrocarbon, (iv) alkyl substituted aromatic hydrocarbon (v)
heterocyclic groups and (vi) heterosubstituted derivatives of said groups (i) to (v); M is
a metal from Group 3 to 11 of the Periodic Table or a lanthanide metal; X is an anionic
group, L is a neutral donor group; n is 1 or 2, y and z are independently zero or integers
such that the number of X and L groups satisfy the valency and oxidation state of the metal
M. The catalyst is used to polymerise 1-olefins especially ethylene and propylene. High
molecular weight homo- and co-polypropylene are disclosed.